



$$6 - \text{ا}) \quad f(x) = x^2 + 1 \xrightarrow{\text{تميز}} f'(x) = 2x \rightarrow 2(1) = 2$$

$$\begin{array}{c|c} 0 & 1 \\ \hline + & + \\ \hline & 2 \end{array}$$



$$\Rightarrow \lim_{x \rightarrow 1} [f(x) - x^2 + 1] = \lim_{x \rightarrow 1} [0] = 0$$

$$6 - \text{ب}) \quad \lim_{x \rightarrow 0} [f(x) - x^2 + 1] \quad \begin{array}{l} \xrightarrow{x \rightarrow 0^+} \lim_{x \rightarrow 0^+} [f'(x)] = 0 \\ \xrightarrow{x \rightarrow 0^-} \lim_{x \rightarrow 0^-} [f'(x)] = 0 \end{array}$$

7. الف)  $\lim_{n \rightarrow 2} \frac{|n-2|(n^2+2n+5)}{(n-2)(n+2)}$

$$\xrightarrow{n \rightarrow 2^+} \frac{(n-2)(n^2+2n+5)}{(n-2)(n+2)} \Rightarrow \frac{12}{4} = 3$$

$$\xrightarrow{n \rightarrow 2^-} \frac{-(n-2)(n^2+2n+5)}{(n-2)(n+2)} \Rightarrow -\frac{12}{4} = -3$$

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7. ب)  $\lim_{n \rightarrow \pi} \frac{|\sin n|}{\sin 2n}$

$$\xrightarrow{n \rightarrow \pi^+} \frac{-\sin n}{2 \sin n \cos n} = \frac{-1}{2 \cos n} = \frac{-1}{2(-1)} = \frac{1}{2}$$

$$\xrightarrow{n \rightarrow \pi^-} \frac{\sin n}{2 \sin n \cos n} = \frac{1}{2 \cos n} = \frac{1}{2(-1)} = -\frac{1}{2}$$

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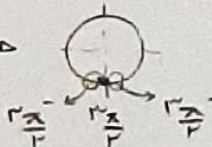
8. الف)  $\lim_{n \rightarrow \frac{\pi}{2}} \sqrt{\cos n}$

$$\xrightarrow{n \rightarrow \frac{\pi}{2}^+} \lim_{n \rightarrow \frac{\pi}{2}^+} \cos n = 0$$

$$\xrightarrow{n \rightarrow \frac{\pi}{2}^-} \lim_{n \rightarrow \frac{\pi}{2}^-} \cos n = 0$$

توان  
زیرادینکل

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ب)  $\lim_{n \rightarrow 0} \sqrt{n-2} \sqrt{n}$

$\xrightarrow{+} = n < 1 \Rightarrow \sqrt{n} > n$   
 زیرادینکل منفی  
 توان  
 $\xrightarrow{-} = n < 0 \Rightarrow \sqrt{n} < n$   
 زیرادینکل منفی  
 توان

9. الف)  $\lim_{n \rightarrow 0^+} \frac{(-1)^{[8n]}}{n^3 - n^2}$

$$\xrightarrow{n \rightarrow 0^+} \frac{-1^0}{n^3 - n^2} = \frac{1}{n^3 - n^2}$$

$n < 1 \Rightarrow n^3 < n^2 \Rightarrow \frac{1}{0^-} = -\infty$

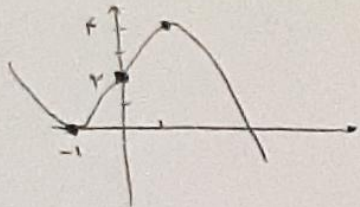
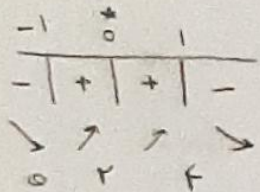
9. ب)  $\lim_{n \rightarrow 2} \frac{n^2 - [n^2]}{n - [n]}$

$$\xrightarrow{n \rightarrow 2^+} \frac{n^2 - 4}{n - 2} = n + 2 = 4$$

$$\xrightarrow{n \rightarrow 2^-} \frac{n^2 - 4}{n - 1} = \frac{1}{1} = 1$$

حد ندارد

10- الف)  $y = 5u^3 - 3u^2 + 2 \xrightarrow{\text{مشتق}} f'(u) = 15u^2 - 6u \Rightarrow 15u^2(1-u) = 15u^2(1-u)(1+u)$



ب)  $y = u^3 - 3u^2 + 3 \xrightarrow{\text{مشتق}} f'(u) = 3u^2 - 6u \Rightarrow 3u(u-1)(u+1)$

